

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Original) A magnetoresistive head comprising: a pinned layer; a free layer; and a non-magnetic spacer film formed between the pinned layer and the free layer; wherein the pinned layer has a first ferromagnetic film and a second ferromagnetic film anti-ferromagnetically coupled to each other by way of an anti-ferromagnetic coupling film; and a coercivity of the first ferromagnetic film is 200 Oe or more and a coercivity of the second ferromagnetic film is 20 Oe or less.
2. (Currently amended) A magnetoresistive head comprising: a pinned layer; a free layer; and a non-magnetic spacer film formed between the pinned layer and the free layer; wherein the pinned layer has a first ferromagnetic film and a second ferromagnetic film anti-ferromagnetically coupled to each other by way of an anti-ferromagnetic coupling film; a composition of the first ferromagnetic film is within a range of: $\text{Co}_{100-X}\text{Fe}_X$ (at %) $40 \leq X \leq 80$; and a composition of the second ferromagnetic film is within a range of: $\text{Co}_{100-Y}\text{Fe}_Y$ (at %) $0 \leq Y \leq 20$, wherein the anti-ferromagnetic coupling film is formed of Ru and has a thickness within a range from 3.0 to 4.0 .ANG.
3. (Currently amended) A magnetoresistive head according to claim 1 ~~or 2~~, wherein the anti-ferromagnetic coupling film is formed of Ru and has a thickness within a range from 3.0 to 4.0 .ANG..
4. (Original) A magnetoresistive head according to claim 1 or 2, wherein a relation between an imaginal thickness DA_0 of the first ferromagnetic film that has a magnetic moment equal to a magnetic moment of the second ferromagnetic film and a thickness DA of the first ferromagnetic film satisfies: $0.0227 \leq (DA - DA_0)/DA_0 \leq 0.136$.

5. (Original) A magnetoresistive head according to claim 4, wherein the magnetic moment of the first ferromagnetic film is larger than that of the second ferromagnetic film.

6. (Original) A magnetoresistive head according to claim 1 or 2, wherein a layer in contact with the first ferromagnetic film is formed from one of Ru, Ta, Cu, and NiFeCr.

7. (Original) A magnetoresistive head according to claim 1 or 2, wherein: the free layer is on the side of a substrate and the pinned layer is on a side remote from the substrate relative to the free layer; and wherein the magnetoresistive head has an underlayer adjacent to the free layer, the underlayer having an NiFeCr layer on the side of the substrate.

8. (Original) A magnetoresistive head according to claim 3, wherein: the free layer is on the side of a substrate and the pinned layer is on a side remote from the substrate relative to the free layer; and wherein the magnetoresistive head has an underlayer adjacent to the free layer, the underlayer having an NiFeCr layer on the side of the substrate.

9. (Original) A magnetoresistive head according to claim 4, wherein: the free layer is on the side of a substrate and the pinned layer is on a side remote from the substrate relative to the free layer; and wherein the magnetoresistive head has an underlayer adjacent to the free layer, the underlayer having an NiFeCr layer on the side of the substrate.

10. (Original) A magnetoresistive head according to claim 5, wherein: the free layer is on the side of a substrate and the pinned layer is on a side remote from the substrate relative to the free layer; and wherein the magnetoresistive head has an underlayer adjacent to the free layer, the underlayer having an NiFeCr layer on the side of the substrate.

11. (Original) A magnetoresistive head according to claim 6, wherein: the free layer is on the side of a substrate and the pinned layer is on a side remote from the substrate relative to the free layer; and wherein the magnetoresistive head has an underlayer adjacent to the free layer, the underlayer having an NiFeCr layer on the side of the substrate.

12. (Original) A magnetoresistive head according to claim 1 or 2, wherein: the pinned layer is on the side of the substrate and the free layer is on a side remote from the substrate relative to the pinned layer; and wherein an underlayer adjacent to the first ferromagnetic film on the side of the substrate comprises a stack of NiFeCr and Ru, a stack of NiFeCr, Ru, and NiFe, or a stack of NiFeCr, Ru, NiFe and Cu, in order from the side of the substrate.

13. (Original) A magnetoresistive head according to claim 3, wherein: the pinned layer is on the side of the substrate and the free layer is on a side remote from the substrate relative to the pinned layer; and wherein an underlayer adjacent to the first ferromagnetic film on the side of the substrate comprises a stack of NiFeCr and Ru, a stack of NiFeCr, Ru, and NiFe, or a stack of NiFeCr, Ru, NiFe and Cu, in order from the side of the substrate.

14. (Original) A magnetoresistive head according to claim 4, wherein: the pinned layer is on the side of the substrate and the free layer is on a side remote from the substrate relative to the pinned layer; and wherein an underlayer adjacent to the first ferromagnetic film on the side of the substrate comprises a stack of NiFeCr and Ru, a stack of NiFeCr, Ru, and NiFe, or a stack of NiFeCr, Ru, NiFe and Cu, in order from the side of the substrate.

15. (Original) A magnetoresistive head according to claim 5, wherein: the pinned layer is on the side of the substrate and the free layer is on a side remote from the substrate relative to the pinned layer; and wherein an underlayer adjacent to the first ferromagnetic film on the side of the substrate comprises a stack of NiFeCr and Ru, a stack of NiFeCr, Ru, and NiFe, or a stack of NiFeCr, Ru, NiFe and Cu, in order from the side of the substrate.

16. (Original) A magnetoresistive head according to claim 6, wherein: the pinned layer is on the side of the substrate and the free layer is on a side remote from the substrate relative to the pinned layer; and wherein an underlayer adjacent to the first

ferromagnetic film on the side of the substrate comprises a stack of NiFeCr and Ru, a stack of NiFeCr, Ru, and NiFe, or a stack of NiFeCr, Ru, NiFe and Cu, in order from the side of the substrate.

17. (Currently amended) A magnetoresistive head according to claim 1 or 2, wherein: the ~~fixed layer~~ pinned layer is on the side of a substrate and the free layer is on a side remote from the substrate relative to the ~~fixed layer~~ pinned layer; and an underlayer adjacent to the first ferromagnetic film on the side of the substrate comprises a stack of NiFeCr, NiFe, PtMn and Ru, or a stack of NiFeCr, NiFe, PtMn and Cu, in order from the side of the substrate.

18. (Currently amended) A magnetoresistive head according to claim 3, wherein: the ~~fixed layer~~ pinned layer is on the side of a substrate and the free layer is on a side remote from the substrate relative to the ~~fixed layer~~ pinned layer; and an underlayer adjacent to the first ferromagnetic film on the side of the substrate comprises a stack of NiFeCr, NiFe, PtMn and Ru, or a stack of NiFeCr, NiFe, PtMn and Cu, in order from the side of the substrate.

19. (Currently amended) A magnetoresistive head according to claim 4, wherein: the ~~fixed layer~~ pinned layer is on the side of a substrate and the free layer is on a side remote from the substrate relative to the ~~fixed layer~~ pinned layer; and an underlayer adjacent to the first ferromagnetic film on the side of the substrate comprises a stack of NiFeCr, NiFe, PtMn and Ru, or a stack of NiFeCr, NiFe, PtMn and Cu, in order from the side of the substrate.

20. (Currently amended) A magnetoresistive head according to claim 5, wherein: the ~~fixed layer~~ pinned layer is on the side of a substrate and the free layer is on a side remote from the substrate relative to the ~~fixed layer~~ pinned layer; and an underlayer adjacent to the first ferromagnetic film on the side of the substrate comprises a stack of NiFeCr, NiFe, PtMn and Ru, or a stack of NiFeCr, NiFe, PtMn and Cu, in order from the side of the substrate.

21. (Currently amended) A magnetoresistive head according to claim 6, wherein: the ~~fixed layer~~ pinned layer is on the side of a substrate and the free layer is on a side remote from the substrate relative to the ~~fixed layer~~ pinned layer; and an underlayer adjacent to

the first ferromagnetic film on the side of the substrate comprises a stack of NiFeCr, NiFe, PtMn and Ru, or a stack of NiFeCr, NiFe, PtMn and Cu, in order from the side of the substrate.

22. (Original) A magnetoresistive head comprising: a first pinned layer; a second pinned layer; a free layer; a non-magnetic spacer film formed between the first pinned layer and the free layer; and another non-magnetic spacer film formed between the second pinned layer and the free layer; wherein each of the first and the second pinned layer has a first ferromagnetic film and a second ferromagnetic film anti-ferromagnetically coupled with each other by way of an anti-ferromagnetic coupling film; and a coercivity of the first ferromagnetic film is 200 Oe or more and a coercivity of the second magnetic layer is 20 Oe or less.

23. (Currently amended) A magnetoresistive head comprising: a first pinned layer; a second pinned layer; a free layer; a non-magnetic spacer film formed between the first pinned layer and the free layer; and another non-magnetic spacer film formed between the second pinned layer and the free layer; wherein each of the first and the second pinned layer has a first ferromagnetic film and a second ferromagnetic film anti-ferromagnetically coupled with each other by way of an anti-ferromagnetic coupling film; and wherein a composition of each of the first ferromagnetic films disposed in each of the first pinned layer and the second pinned layer is within a range of: $\text{Co.sub.100-XFe.sub.X}$ (at %) $40.\text{ltoreq.X.ltoreq.80}$, and a composition of the second ferromagnetic film is within a range of: $\text{Co.sub.100-YFe.sub.Y}$ (at %) $0.\text{ltoreq.Y.ltoreq.20}$, wherein each of the anti-ferromagnetic coupling film of the first pinned layer and the second pinned layer is formed of Ru and has a thickness within a range from 3.0 to 4.0 .ANG..

24. (Currently amended) A magnetoresistive head according to claim 22 or 23, wherein each of the anti-ferromagnetic coupling films of the first pinned layer and the second pinned layer is made of Ru and has a thickness within a range from 3.0 to 4.0 .ANG..

25. (Original) A magnetoresistive head according to claim 22 or 23, wherein a relation between the imaginal thickness DA_0 of the first ferromagnetic film that has a magnetic

moment equal to the magnetic moment of the second ferromagnetic film and a thickness DA of the first ferromagnetic film satisfies: $0.0227 \cdot \text{ltoreq} \cdot (DA - DA_0) / DA_0 \cdot \text{ltoreq} \cdot 0.136$

26. (Original) A magnetoresistive head according to claim 25, wherein the magnetic moment of the first ferromagnetic film is larger than that of the second ferromagnetic film.

27. (Currently amended) A method of manufacturing a magnetoresistive head comprising a pinned layer having a first ferromagnetic film and a second ferromagnetic film anti-ferromagnetically coupled with each other by way of an anti-ferromagnetic coupling film, a free layer and a permanent magnet film disposed at an end of the free layer, said method comprising: a first magnetic field application step of applying a magnetic field in a desired direction different from a direction of a magnetic moment magnetized to the pinned layer; and a second magnetic field application step of applying a magnetic field in a direction different from the direction of the magnetic field application in the first magnetic field application step, wherein said first and second magnetic field application step is conducted at room temperature.

28. (Currently amended) A method of manufacturing a magnetoresistive head comprising a pinned layer having a first ferromagnetic film and a second ferromagnetic film anti-ferromagnetically coupled with each other by way of an anti-ferromagnetic coupling film, a free layer and a permanent magnet film disposed at an end of the free layer, said method comprising:
a first magnetic field application step of applying a magnetic field in a desired direction different from a direction of a magnetic moment magnetized to the pinned layer; and
a second magnetic field application step of applying a magnetic field in a direction different from the direction of the magnetic field application in the first magnetic field application step ~~A method of manufacturing a magnetoresistive head according to claim 27,~~ wherein the following relation is satisfied: $H_1 \cdot \text{gtoreq} \cdot 0.4 H_s H_c \cdot \text{ltoreq} \cdot H_2 \cdot \text{ltoreq} \cdot 0.35 H_s$, where H_s is a saturation magnetic field that brings respective magnetic moments of the first ferromagnetic film and the second ferromagnetic film antiparallel to each other into a parallel state, H_c is the coercivity of the permanent magnetic layer, H_1 is a magnitude of an application

magnetic field in the first magnetic field application step, and H2 is a magnitude of an application magnetic field in the step of applying the second magnetic field.